ATTACHMENT 11

ILLINOIS POLLUTION CONTROL BOARD
September 8, 2016

EXELON GENERATION, LLC,	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB 16-106
	)	(Variance - Air)
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
	)	
Respondent.	)	

OPINION AND ORDER OF THE BOARD (by C.K. Zalewski):

Exelon Generation, LLC has over 700,000 gallons of diesel fuel stored in tanks at four of its nuclear power plants. Having such a large volume of fuel available for on-site emergency equipment is required by the Nuclear Regulatory Commission (NRC). The emergency equipment includes diesel-powered generators for providing power to the grid during a plant blackout and diesel-powered fire pumps for providing water to extinguish fires and cool reactors.

Exelon's emergency fuel contains high concentrations of sulfur. Most of the fuel was purchased before 2007, when lower sulfur fuel was not commercially available. Since 2007, Exelon has purchased lower sulfur fuel, but only in the small quantities necessary to replenish the storage tanks. Because of the NRC requirement, Exelon combusts very little of the fuel, usually only when periodically maintaining and testing the emergency equipment. Accordingly, despite some dilution over the last nine years, the fuel's sulfur content remains high.

To emit less of the pollutant sulfur dioxide (SO_2) into the air, only lower sulfur fuel can be combusted as of January 1, 2017, under a rule that the Board adopted at the end of last year. Exelon has petitioned the Board for a variance from this "Sulfur Content Rule," seeking more time to comply. It is possible for Exelon to drain and replace all of its higher sulfur fuel, but the company would risk violating the NRC's emergency fuel requirement, potentially jeopardize nuclear safety readiness, and incur $1.7 million in additional costs. Alternatively, combusting all of the higher sulfur fuel by the end of this year would violate the facilities' air pollution control permits and waste energy. The Illinois Environmental Protection Agency (IEPA) believes that the Board can grant Exelon's requested variance without harming the public or the environment and without running afoul of the federal Clean Air Act.

For these and other reasons discussed below, the Board finds that requiring Exelon to timely comply with the Sulfur Content Rule would impose an arbitrary or unreasonable hardship on the company. The Board therefore grants Exelon a variance, subject to conditions, for the company's Byron, Clinton, Dresden, and LaSalle Generating Stations. In this opinion, the Board first briefly describes the procedural history of the case. The Board then provides legal background on variances and the Sulfur Content Rule, after which the Board makes its findings

of fact. Next, the Board analyzes the legal issues and reaches its conclusions of law. Following the opinion, the Board's order sets forth the variance and its conditions.

PROCEDURAL HISTORY

On May 18, 2016, Exelon filed its variance petition (Pet.), the facts of which have been sworn to in the affidavit of Roland Beem, Environmental Programs Manager for Exelon. Exelon provided timely newspaper notice of its petition and the Board received no objection to the petition. *See* 415 ILCS 5/37(a) (2014); 35 Ill. Adm. Code 104.214.

After accepting the petition by order of June 2, 2016, the Board issued an order on June 16, 2016, directing Exelon to provide additional information. Exelon did so on July 14, 2016 (Resp.). IEPA filed its recommendation concerning the petition on July 5, 2016 (IEPA Rec.). *See* 415 ILCS 5/37(a) (2014); 35 Ill. Adm. Code 104.216. Through a July 21, 2016 hearing officer order, the Board directed Exelon to again provide more information. On July 28, 2016, Exelon filed another response (2nd Resp.).

Exelon waived hearing; no hearing was requested by IEPA or the public; and the Board finds that no hearing is necessary. *See* 415 ILCS 5/37(a) (2014); 35 Ill. Adm. Code 104.234.

LEGAL BACKGROUND

Variances

A "variance is a temporary exemption from any specified rule, regulation, requirement or order of the Board." *See* 35 Ill. Adm. Code 104.200(a)(1). Under the Environmental Protection Act (Act) (415 ILCS 5 (2014)), the Board "may grant individual variances beyond the limitations prescribed in this Act, whenever it is found, upon presentation of adequate proof, that compliance with any rule or regulation, requirement or order of the Board would impose an arbitrary or unreasonable hardship." 415 ILCS 5/35(a) (2014); *see also* 35 Ill. Adm. Code 104.200, 104.208, 104.238. However, the Board is authorized to grant a variance only to the extent consistent with applicable federal law, including the Clean Air Act and its regulations, and only for up to five years. *See* 415 ILCS 5/35, 36(b) (2014). Further, in granting a variance, the Board may impose conditions that promote the policies of the Act. *See* 415 ILCS 5/36(a) (2014).

The burden of proof is on the petitioner. *See* 415 ILCS 5/37(a) (2014); 35 Ill. Adm. Code 104.200(a)(1), 104.238(a). The petitioner must prove that timely compliance with the Board rule or order would cause an arbitrary or unreasonable hardship that outweighs the public interest in timely compliance with the rule or order. *See* Willowbrook Motel v. IPCB, 135 Ill. App. 3d 343, 349-50 (1st Dist. 1985).

Sulfur Content Rule

The Board's Sulfur Content Rule is designed to reduce SO_2 emissions by requiring that the sulfur content of distillate fuel oil combusted on or after January 1, 2017, not exceed 15 parts

per million (ppm). *See* 35 Ill. Adm. Code 214.161(b)(2). The rule applies to owners and operators of existing fuel combustion emission sources that burn liquid fuel exclusively.

IEPA proposed the Sulfur Content Rule in response to the primary SO_2 National Ambient Air Quality Standard (NAAQS), which the United States Environmental Protection Agency (USEPA) adopted on June 22, 2010. USEPA's action replaced the 24-hour and annual SO_2 standards with a one-hour SO_2 standard. The Board adopted the Sulfur Content Rule on November 19, 2015, and it became effective on December 7, 2015. *See* Amendments to 35 Ill. Adm. Code Part 214, Sulfur Limitations, Part 217, Nitrogen Oxides Emissions, and Part 225, Control of Emissions from Large Combustion Sources, R15-21 (Nov. 19, 2015); 39 Ill. Reg. 16174 (Dec. 18, 2015).[1]

Effective October 4, 2013, USEPA designated two areas in Illinois as not attaining the 2010 one-hour SO_2 NAAQS: (1) the Lemont nonattainment area (Lemont Township in Cook County and DuPage County, and Lockport Township in Will County); and (2) the Pekin nonattainment area (Cincinnati and Pekin Townships in Tazewell County, and Hollis Township in Peoria County). *See* 78 Fed. Reg. 47191, 47192 (Aug. 5, 2013); *see also* 40 C.F.R. § 81.314. More recently, on July 12, 2016, USEPA established two additional nonattainment areas in Illinois: the Madison County, Alton Township Area and Williamson County. 81 Fed. Reg. 45039 (July 12, 2016). None of the Exelon facilities subject of the petition for variance are located within these nonattainment areas.

The Sulfur Content Rule will address these nonattainment areas, but the rule applies statewide to aid in planning for any future nonattainment designations. Pet. Exh. A at 7 (IEPA's R15-21 Statement of Reasons). IEPA included the Sulfur Content Rule in Illinois' State Implementation Plan (SIP) for the 2010 SO_2 NAAQS, which was submitted to USEPA for approval. Pet. at 6.

THE FOUR EXELON STATIONS

In this section of the opinion, the Board describes the four nuclear power plants individually, including emergency equipment, diesel fuel storage, and air permitting.[2] Exelon owns and operates the four nuclear power facilities: Byron Station, Ogle County; Clinton Station, DeWitt County; Dresden Station, Grundy County; and LaSalle Station, LaSalle County. Pet. at 10-14.

Byron Station began commercial operation in 1985. It can generate approximately 2,347 net megawatts of electricity. Pet. at 10. Byron has 15 tanks—with a total capacity of 255,500

[1] IEPA's R15-21 rulemaking proposal included, and the Board adopted, site-specific provisions that give Midwest Generation, LLC and Caterpillar, Inc. more time to comply with the Sulfur Content Rule. *See* 35 Ill. Adm. Code 214.161(c), (d).

[2] Exelon's two other nuclear facilities (Braidwood Station and Quad Cities Station) are not subject to this variance proceeding. Pet. at 2 n.1.

gallons—that store diesel fuel for its emergency equipment.[3] Pet. at 20-21. Samples taken October 2015-April 2016 from the 15 tanks had an average sulfur concentration of 42 ppm, with an average of 19 ppm for the seven largest tanks, which total 250,000 gallons of storage capacity. *Id.*; Pet. App. B, Table 5; Pet. App. C, Table 9. One tank's sample contained 230 ppm sulfur, the highest measured sulfur concentration at the station. Pet. App. B, Table 5. IEPA issued a Federally Enforceable State Operating Permit (FESOP) to Byron Station in 2015, expiring in 2025. Pet. at 11. Byron Station emitted 0.03 ton of SO_2 in 2015. *Id.*

Clinton Station began commercial operation in 1987 and can generate 1,069 net megawatts of electricity. Pet. at 12. Clinton Station has six tanks—with a total capacity of 137,193 gallons—that store diesel fuel for its emergency equipment. Pet. at 20-21. Samples taken February 2014-October 2015 from the six tanks had an average sulfur concentration of 131 ppm, with the same average concentration for the three largest tanks, which total 135,000 gallons of storage capacity. *Id.*; Pet. App. B, Table 6; Pet. App. C, Table 9. Two tanks' samples contained 160 ppm sulfur, the highest measured sulfur concentration at the station. Pet. App. B, Table 6. IEPA issued a FESOP to Clinton Station in 2014, expiring in 2024. Pet. at 13. Clinton Station emitted 0.061 ton of SO_2 in 2015. *Id.*

Dresden Station began commercial operation in 1970 and can generate 1,845 net megawatts of electricity. Pet. at 13. Dresden has 11 tanks—with a total capacity of 117,775 gallons—that store diesel fuel for its emergency equipment. Pet. at 20-21; Pet. App. C, Table 9; Resp. at 7. Samples taken in March 2016 from 10 tanks at the station (excluding the 70,000-gallon auxiliary boiler tank) had an average sulfur concentration of 17 ppm, with an average of 16 ppm for the three 15,000-gallon tanks. Pet. at 14; Pet. App. B, Table 7; Pet. App. C, Table 9; Resp. at 7. Based upon a limited history of sampling, the exact sulfur concentration of the largest tank, the 70,000-gallon auxiliary boiler tank, is unknown but assumed to be greater than 150 ppm. The next highest sulfur concentration sampled at Dresden was 21 ppm from two small tanks. Pet. at 21 n.10; Pet. App. B, Table 7; Pet. App. C, Table 9. IEPA issued a FESOP to Dresden Station in 2014, expiring in 2024. Pet. at 14. Dresden Station emitted 0.063 ton of SO_2 in 2015. *Id.*

LaSalle Station began commercial operation in 1984 and can generate 2,286 net megawatts of electricity. Pet. at 14-15. LaSalle has 15 tanks—with a total capacity of 197,200 gallons—that store diesel fuel for its emergency equipment. Pet. at 20-21. In March 2016, samples representative of 12 tanks at the station (excluding three smaller tanks) had an average sulfur concentration of 151 ppm, with an average of 146 ppm for the five largest tanks, which total 187,900 gallons of storage capacity. Pet. at 15; Pet. App. B, Table 8; Pet. App. C, Table 9. One tank's sample contained 211 ppm sulfur, the highest measured sulfur concentration at LaSalle. Pet. App. B, Table 6. IEPA issued a FESOP to LaSalle Station in 2015, expiring in 2025. Pet. at 15. LaSalle Station emitted 0.057 ton of SO_2 in 2015. *Id.* at 16.

[3] The Board refers to the emergency generators and fire pumps at all four stations, as well as the auxiliary boilers at Byron and Dresden Stations, collectively as "emergency equipment." Pet. at 2 n.3.

BOARD ANALYSIS

The Board must determine whether Exelon has shown that the company would suffer an arbitrary or unreasonable hardship if its four nuclear power plants (Byron, Clinton, Dresden, and LaSalle Stations) are required to timely comply with the Sulfur Content Rule. *See* 415 ILCS 5/35(a) (2014). Under that rule, distillate fuel combusted on or after January 1, 2017, must not exceed 15 parts ppm in sulfur content. *See* 35 Ill. Adm. Code 214.161(b)(2).

Nuclear power plants are required by NRC rules to have emergency equipment ready for use if the plant loses power, has a fire, or faces another emergency. The NRC requires that each nuclear power plant maintain seven days' worth of fuel on-site to power the emergency generators. Accordingly, Exelon stores a large supply of diesel fuel at each of its four plants, enough to operate that facility's emergency generators for seven days. Collectively, the four plants have 707,668 gallons of storage tank capacity for emergency fuel. The emergency tanks are emptied, cleaned, and inspected once every ten years, but otherwise, all of the tanks remain filled to near capacity to meet the NRC's seven-day requirement. Pet. at 24; Pet. App. B, Tables 5-8; *see infra* at 9.

Very little of this stored fuel is ever combusted; typically, Exelon uses it only when maintaining and testing the emergency equipment. Since ultra-low sulfur diesel (ULSD) became commercially available in 2007, Exelon has been replenishing the emergency tanks with ULSD, which meets the 15 ppm or less sulfur content limit. But, as most of the stored fuel is made up of the previously-purchased higher sulfur fuel, adding ULSD has not reduced the sulfur content of the resulting blend to 15 ppm. In fact, average sulfur concentrations are well above this limit. *See supra* at 4.

Compliance Alternatives

Presently, Exelon has over 707,000 gallons of emergency fuel stored across the four stations. If combusted on or after January 1, 2017, the fuel would fail to comply with the Sulfur Content Rule. Exelon considered four potential options to comply with the rule as of January 1, 2017: (1) combusting all of the fuel; (2) continuing to dilute the fuel's sulfur concentrations with ULSD; (3) draining all of the storage tanks and refilling them with ULSD; or (4) draining and refilling only the larger tanks. None of these alternatives are practicable. Exelon argues that it is the "short timeframe" for complying with the Sulfur Content Rule that presents a substantial hardship to the company. Resp. at 1. The Board agrees with Exelon (Pet. at 23-24; Resp. at 6), as discussed below, that none of its four potential alternatives to comply by January 1, 2017, are practicable.

Combusting the Entire Fuel Supply Would Be Illegal.

Because NESHAP prohibits operating the emergency equipment for more than 100 hours annually in non-emergency situations, Exelon cannot legally combust all of the emergency fuel (to replace it with ULSD) by January 1, 2017. Pet. at 9, 23. The Board finds that each station's emergency equipment would have to operate far in excess of the hour limit to burn all of the

currently-stored fuel during the remainder of this year. Plus, absent an emergency, burning the fuel just to get rid of it would waste the resulting energy. *Id.* at 23-24.

Continuing to Dilute the Fuel Supply Would Not Work Fast Enough.

Exelon uses the emergency equipment infrequently and keeps the associated fuel tanks nearly filled to their 707,668-gallon capacity. Pet. at 3, 4, 8, 23, 24. Accordingly, replenishing with small amounts of ULSD, even for nine years, has not reduced sulfur concentrations to 15 ppm:

- Samples from all 15 tanks at Byron Station average 42 ppm sulfur, with the highest concentration at 230 ppm; 250,000 gallons average 19 ppm sulfur;
- Samples from all six tanks at Clinton Station average 131 ppm sulfur, with the highest concentration at 160 ppm; 135,000 gallons average 131 ppm sulfur;
- Samples from 10 tanks (47,775 gallons of capacity) of the 11 tanks at Dresden Station average 17 ppm sulfur, but the facility's eleventh tank, the 70,000-gallon auxiliary boiler tank, is assumed to contain fuel with sulfur concentrations exceeding 150 ppm; and
- Samples representing 12 of the 15 tanks at LaSalle Station average 151 ppm sulfur, with the highest concentration at 211 ppm; 187,900 gallons average 146 ppm sulfur. *Id.*; Resp. at 11; Pet. Exh. B, Tables 5-8.

Based upon these sulfur concentrations and fuel volumes, the Board finds that merely continuing to replenish the tanks with small amounts of ULSD will not dilute the sulfur content of the stored fuel to 15 ppm or less by January 1, 2017.

Immediately Draining All of the Fuel Tanks Would Be Difficult, Dangerous, and Expensive.

The four stations have 47 emergency fuel tanks with 707,668 gallons of total storage capacity. These tanks currently store over 707,000 gallons of noncompliant fuel. Exelon maintains that immediately draining and replacing all of this fuel presents "serious safety and logistical challenges," may "compromise nuclear safety readiness," and would cost the company about an extra $1.7 million. Pet. at 4; Resp. at 6. The Board agrees that these factors make this option impracticable.

First, Exelon explains that emergency fuel tank cleanings and inspections at nuclear power plants are "comprehensively planned, pre-scheduled events" that take into account logistics, security, and safety. Pet. at 4. They are typically completed only every ten years. *Id.* at 24. Temporarily reducing the fuel available for emergency equipment is strategically designed to ensure NRC compliance and public safety. *Id.* at 4. Immediately draining the tanks would violate the NRC requirement to maintain a seven-day fuel supply for emergency diesel generators, which would limit the stations' operation and could force a controlled shutdown of their nuclear reactors. *Id.* at 9; *see infra* at 9.

Second, draining the fuel out of all of the emergency tanks and replacing it with ULSD by January 1, 2017, would require extensive planning and prove labor and time intensive. Pet. at 10. Exelon warns that inadequate and hurried planning would increase the likelihood of

"performance errors (*e.g.* spills, worker injuries)" and could "adversely affect nuclear safety." *Id.* at 24. Security procedures are extensive for entering the stations' restricted areas that house the tanks. *Id.* at 10. For example, before entering one of these fenced areas, each truck must be thoroughly inspected by station security, which can take two hours per truck. *Id.* Up to 20 trucks may be needed to drain and refill a single large tank, and yet the number of trucks allowed to enter a restricted area at any one time is limited. *Id.* Besides security, a tank fuel change-out would require significant labor resources, including operations, chemistry, radiation protection, supply, maintenance, planning, and management oversight. *Id.*

Third, Exelon estimates that to immediately drain and replace the currently-stored fuel, it would incur $1,747,060 *more* in costs than it would under the variance, and this figure takes into account the resale value of the fuel Exelon has now. Pet. at 24; Pet. App. C, Table 9; Resp. at 5-6. $1,747,060 is the difference between Exelon's estimated $3,950,036 to comply with the Sulfur Content Rule as of January 1, 2017, and Exelon's estimated $2,202,976 to comply with the Sulfur Content Rule by the end of the variance period. Pet. App. C, Table 9.

The $2.2 million figure consists of the costs to drain and replace the fuel for Clinton and LaSalle Stations, as well as the fuel in the auxiliary boiler tank at Dresden Station. This is the fuel that *is not* likely to meet the 15 ppm sulfur limit by the end of the variance period merely through continued dilution. Resp. at 6; Pet. App. C, Table 9 n.18. Thus, even if the variance is granted, this fuel (about 392,900 gallons) would have to be drained and replaced over the five-year variance period. Pet. App. C, Table 9 n 17 & n.18.

The $1.7 million figure consists of the costs to drain and replace the fuel for Byron and Dresden Stations (excluding the fuel in Dresden Station's auxiliary boiler tank). This is the fuel that *is* likely to meet the 15 ppm sulfur limit by the end of the variance period merely through continued dilution. Resp. at 6; Pet. App. C, Table 9 n.18. Thus, if the variance is granted, this fuel (about 315,000 gallons) would not have to be drained and replaced. Pet. App. C, Table 9 n 17 & n.18.

Immediately Draining Only the Larger Tanks Would Pose Similar Problems and Still Require Variance Relief.

Exelon estimates that replacing 190,000 gallons of its fuel—the fuel in Dresden Station's 70,000-gallon tank and LaSalle Station's three 40,000-gallon tanks—with ULSD would cost $1,055,221, subtracting the value of reselling the 190,000 gallons of noncompliant fuel. Resp. at 7. Besides this additional expense, the vast majority of Exelon's fuel (over 517,000 gallons) would still be out of compliance on January 1, 2017. Plus, draining and replacing only these larger tanks during what is left of this calendar year presents concerns similar to those discussed immediately above, albeit on a smaller scale: safety, security, and seven-day fuel supply compliance. The Board agrees with Exelon that the company's compliance plan would allow *all* of the noncompliant fuel to be addressed "safely and securely," on a schedule that reflects the "unique nature and purpose" of the tanks at these nuclear power plants. *Id.*

Exelon's Requested Relief

Exelon requests a variance that would allow its emergency equipment to combust the noncompliant fuel for three years at Byron Station, four years at Clinton Station, three years at Dresden Station, and five years at LaSalle Station. According to Exelon, the additional time will permit the company to comply with the 15 ppm sulfur limit in a "safe and orderly fashion." Resp. at 2. Exelon maintains that, by the end of these timeframes, it will meet the 15 ppm limit through a combination of (1) continuing to dilute the sulfur content of lower sulfur tanks with ULSD and (2) emptying the higher sulfur tanks and refilling them with ULSD as part of a coordinated tank cleaning and equipment preventative maintenance program.

IEPA does not object to the Board granting the variance petition. Rec. at 1, 11. If the Board does so, Exelon's SO_2 emissions, even under "worst-case" assumptions, would be only minimally greater than if Exelon were to timely comply with the Sulfur Content Rule. In IEPA's opinion, granting the variance would not result in any injury to the public or the environment. Also, Exelon agrees to offset its additional emissions by purchasing and retiring SO_2 allowances.

Weighing the hardship to Exelon from denying the variance against any increased SO_2 emissions from granting the variance, the Board finds that requiring Exelon to comply with the Sulfur Content Rule as of January 1, 2017, would impose an arbitrary or unreasonable hardship on the company. The Board also finds that granting the variance would not compromise the State's obligations under the Clean Air Act, including those in the SIP for SO_2 NAAQS compliance. Under these circumstances, as further detailed below, the Board grants a variance to Exelon, subject to conditions.

In this part of the opinion, the Board addresses the issues in five steps. First, the Board considers the hardship that Exelon would suffer from a variance denial. Second, the Board considers any harm that the public or the environment would suffer from a variance grant. Third, the Board weighs Exelon's hardship from a variance denial against any public or environmental harm from a variance grant. Fourth, the Board considers whether granting the variance would be consistent with federal law. And fifth, the Board considers the conditions of the variance, including the sufficiency of Exelon's compliance plan.

Denying the Variance Would Impose a Substantial Hardship on Exelon

The Board finds that Exelon would suffer a substantial hardship if denied the requested variance, *i.e.*, if required to timely comply with the Sulfur Content Rule. Here, the Board first discusses the emergency equipment and associated fuel tanks at the four nuclear power plants, followed by the legal requirements that significantly limit their use. The Board then turns to why Exelon has no practicable way to bring its emergency fuel supply into compliance with the 15 ppm sulfur limit by January 1, 2017.

Emergency Equipment and Associated Fuel Tanks

At each of the four nuclear power plants, Exelon stores diesel fuel in tanks for emergency equipment. Pet. at 3. The diesel fuel powers three types of emergency equipment: (1)

emergency generators (all four stations); (2) auxiliary boilers (Byron and Dresden Stations only); and (3) fire pumps (all four stations).[4] *Id.* at 2, 10, 12, 13, 15; *id.* at 2 n.3. Because the emergency equipment is rarely used other than for periodic maintenance and readiness tests (generators and pumps) and supplemental winter heating (auxiliary boilers), the tanks contain diesel fuel bought before 2007.

NRC and Air Pollution Control Requirements

NRC rules require each nuclear power plant to maintain emergency equipment on-site for use whenever the station has a loss of power or other emergency. Pet. at 7, citing 10 C.F.R. § 50.63, Pet. Exh. B (LaSalle Tech. Spec. 3.8.3). Two other NRC requirements greatly restrict the use of emergency equipment and associated fuel. First, emergency equipment must start up and provide the necessary power "greater than 97.5% of the time over a rolling two-year period." Pet. at 7, citing 10 C.F.R. §§ 50.63 & 50.65, Pet. Exh. C (*Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, NRC Regulatory Guide 1.160 (May 2012)), & Pet. Exh. D (*Station Blackout*, NRC Regulatory Guide 1.155 (Aug. 1988)). Because this "Availability" requirement limits the time that emergency equipment can be unavailable, Exelon preventatively maintains the equipment and fuel tanks only every two years. Pet. at 7.

Second, each nuclear power plant must store on-site a volume of fuel sufficient to power its emergency diesel generators for seven days. Pet. at 7, citing, *e.g.*, Pet. Exh. B (LaSalle Tech. Spec. 3.8.3); *see also Fuel Oil Systems for Emergency Power Supplies*, NRC Regulatory Guide 1.137 (June 2013)). To maintain the seven-day supply, Exelon keeps its emergency tanks filled to near capacity. Pet. at 7-9, 24. If the minimum fuel supply is not "immediately available," the station enters a "Limiting Condition for Operation", threatening its ability to meet the Availability requirement. *Id.* at 9. Failure to restore the minimum fuel supply within seven days requires that the station begin a controlled shutdown of the affected nuclear reactor, impacting the "nuclear safety margin." *Id.*[5]

Exelon's ability to use the emergency equipment is further restricted by air pollution control requirements: each station's FESOP; the New Source Performance Standards (NSPS) for "Stationary Compression Ignition Internal Combustion Engines" (NSPS IIII, 40 C.F.R. §§ 60.4200 *et. seq.*); and the National Emission Standards for Hazardous Air Pollutants (NESHAP) for "Stationary Reciprocating Internal Combustion Engines" (Maximum Achievable Control Technology (MACT) ZZZZ, 40 C.F.R. §§ 63.6580 *et. seq.*). Pet. at 8-9. For example, the NESHAP prohibits operating emergency engines in non-emergency situations for more than 50 hours per year, excluding maintenance, testing, and emergency demand response; but, even maintenance checks and readiness tests are limited to 100 hours per year. *Id.* at 9, citing 40 C.F.R. § 63.6640(f). IEPA does not dispute any of Exelon's statements about the effect of these air pollution control requirements on emergency equipment use. Rec. at 3.

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[4] *See* footnote 3.

[5] Exelon's proposed 2017 closure of Clinton Station would not affect the requested variance because NRC emergency equipment requirements would continue to apply after closure. Resp. at 11.

Granting the Variance Would Not Harm the Public or the Environment

The Board finds that granting the variance would allow only minimally increased SO_2 emissions, resulting in no harm to the public or the environment. The Board compares the public and environmental impact of granting the variance to the public and environmental impact of requiring Exelon's timely compliance with the Sulfur Content Rule. Exelon's plan for complying with the rule by the end of the variance period calls for continuing to replenish the lower sulfur tanks with ULSD; and, as part of a coordinated program, emptying the higher sulfur tanks and refilling them with ULSD. Pet. at 5, 17-18.

Under the "worst-case scenario," Exelon estimates that it would emit a total of 1.284 more tons of SO_2 under the variance than if it timely complied with the Sulfur Content Rule. Resp. at 4; Resp. Exh. B. This estimate is considered a worst case because it assumes that all of the fuel burned during the variance period would contain 250 ppm sulfur. However, it is more realistic (and still conservative) to assume sulfur concentrations equal to those from the tank samples, in which case Exelon estimates that its SO_2 emissions would be a total of 0.481 ton greater than if it timely complied with the rule. Pet. at 5, 20-21; Resp. at 3; Resp. Exh. B.

Of course, as Exelon replenishes the emergency tanks with ULSD, sulfur concentrations in the fuel would be further reduced over time. Pet. at 19. Taking this dilution into account and using the annual averages for fuel burned over the last five years, the estimated SO_2 emissions with the variance are 0.067 more ton *per year* than with compliant fuel. As the variance relief would last from three to five years, depending upon the station, Exelon estimates that it would emit a total of 0.26 more ton of SO_2 under the variance than if it timely complied with the Sulfur Content Rule. *Id.* at 5, 21-22, 30; Resp. Exh. C.

IEPA does not believe that "any injury to the public or environment will result" from granting the variance. Rec. at 9. The purpose of applying the Sulfur Content Rule *statewide* was to minimize impacts on current as well as any future designated SO_2 nonattainment areas. Pet. Exh. A at 7 (IEPA's R15-21 Statement of Reasons). IEPA states that the estimated additional SO_2 emissions under the variance are "extremely unlikely to impact an SO_2 nonattainment area." Rec. at 9. IEPA confirms that none of the power stations are located in a current SO_2 nonattainment area. *Id.* As for areas being investigated and modeled, IEPA found no overlap with the four stations and therefore does not believe that the stations will impact potential future nonattainment areas. *Id.*

On the other hand, Exelon estimates that draining and replacing all of the fuel by January 1, 2017, would require 260 tanker trucks burning 6,000 gallons of fuel (150-mile roundtrip). This fleet would emit 1.25 lbs of SO_2, 759.54 lbs of nitrogen oxides (NO_x), and 19.31 lbs of ten-micron particulate matter (PM_{10}). Pet. at 25. Exelon adds that because the higher sulfur fuel would be sold and eventually combusted elsewhere, the sulfur would still be emitted. *Id.* Further, removing and replacing over 707,000 gallons of fuel risks spills that could impact waters. *Id.*

Finally, Exelon started fueling Dresden Station's auxiliary boilers primarily with natural gas in October 2015. Pet. at 3, 22. Exelon contends that the additional emissions from the

variance would be partially offset by the emission reductions resulting from this change to natural gas. *Id.* However, Exelon does not quantify this offset or commit to burning natural gas during the variance period. But, Exelon does agree to buy and retire 50 tons of Illinois-based SO_2 Group 1 allowances under the Cross-State Air Pollution Rule. 2nd Resp. at 1. When compared with the variance's potential for a total of 1.284 tons of additional SO_2 emissions under worst-case assumptions, retiring 50 tons of allowances would represent about a 38:1 offset for the five-year variance period.

Exelon's Hardship from a Variance Denial Outweighs Any Adverse Public or Environmental Impact from a Variance Grant

The Board finds that requiring Exelon to comply with the Sulfur Content Rule as of January 1, 2017, would impose an arbitrary or unreasonable hardship on the company. *See* 415 ILCS 5/35(a) (2014). In deciding whether to grant a variance, the Board must weigh the hardship to the petitioner from denying the variance against the adverse impact to the public or the environment from granting the variance. *See* Marathon Oil Co. v. IEPA, 242 Ill. App. 3d 200, 206 (5th Dist. 1993). Exelon must establish that its hardship from a denial "outweighs any injury to the public or the environment" from a grant. *Id.* Thus, "only if the hardship outweighs the injury does the evidence rise to the level of an arbitrary or unreasonable hardship." *Id.*

Exelon has demonstrated that none of the four compliance alternatives are practicable for meeting the 15 ppm sulfur limit as of January 1, 2017. Indeed, Exelon's timely compliance with the Sulfur Content Rule could be achieved lawfully only by draining all of the emergency tanks and refilling them with ULSD, but that option raises problems. Under NRC requirements, draining the emergency fuel tanks—without restoring the minimum inventory within seven days—would force Exelon to begin controlled shutdowns of the affected nuclear reactors. Also, besides the extra SO_2, NO_x, and PM_{10} emissions from the necessary truck transportation, having 260 tanker trucks entering and exiting restricted areas to empty and refill the tanks by the end of this year would pose significant safety and security challenges. And, it would cost Exelon approximately $1.7 million more than with the variance. Exelon would not incur any additional costs under the variance because it already replenishes combusted fuel with ULSD and maintains and cleans the tanks. Pet. at 18-19.

Over the five-year variance period, the estimated *additional* SO_2 emissions range from 0.26 ton to 1.284 tons, *i.e.*, the SO_2 emissions greater than those that would result from timely meeting the rule. IEPA does not believe that the requested variance would injure the public or the environment or interfere with attaining the SO_2 NAAQS. Plus, Exelon agrees to buy and retire 50 tons of SO_2 allowances. This would result in roughly a 38:1 annual SO_2 offset, using the highest estimate of additional SO_2 emissions.

The Board finds that the hardship to Exelon of incurring about an extra $1.7 million—and potentially risking nuclear safety in the process—outweighs any adverse public or environmental impact from granting the variance.

The Variance Is Consistent with Federal Law

The Board finds that the requested variance is consistent with federal law. The Clean Air Act requires that States submit SIPs to USEPA to attain SO_2 NAAQS. *See* 42 U.S.C. §§ 7502, 7514, 7514a. As part of the Illinois SIP for the 2010 SO_2 NAAQS, IEPA submitted the Sulfur Content Rule to USEPA and is awaiting approval. Rec. at 9. If the Board grants Exelon's petition, IEPA will submit the variance to USEPA for approval as a SIP revision. *Id.* at 10. In the meantime, IEPA conferred with USEPA regarding Exelon's variance request; USEPA indicated that the variance would not "threaten violations of the SO_2 NAAQS." *Id.* The Board finds that granting the variance, subject to conditions, would be in accord with Illinois' current SO_2 NAAQS obligations.

Further, granting the variance would not interfere with applicable NSPS and MACT requirements. Some of Exelon's emergency equipment is subject to NSPS IIII and all of the diesel fuel engines are subject to MACT ZZZZ. Under these rules, on and after October 1, 2010, the diesel fuel used must be 15 ppm or less sulfur. But, the rules allow diesel fuel above this threshold to be used until the fuel is depleted if it was purchased before October 1, 2010. *See* 40 C.F.R. § 60.4207(b); *see also* 40 C.F.R. §§ 63.6604, 80.510(b).

The Variance's Conditions Will Promote the Act's Policies

The Board finds that, with minor modifications, the variance conditions proposed or agreed to by Exelon will further the Act's policies of protecting the environment. *See* 415 ILCS 5/2(b), 36(a) (2014). Under Exelon's plan, the company would comply with the 15 ppm sulfur limit of the Sulfur Content Rule by the following dates: January 1, 2020, at Byron and Dresden Stations; January 1, 2021, at Clinton Station; and January 1, 2022, at LaSalle Station. Pet. at 19. The varying lengths of the relief is based upon (1) the different amounts of, and sulfur concentrations in, the emergency fuel at each station and (2) the expected sulfur-content dilution of each station's stored fuel due to replenishing with ULSD.

Exelon maintains that by these deadlines, its fuel will comply with the 15 ppm limit through a two-pronged approach:

- Continue replenishing the lower sulfur tanks with ULSD to further dilute the sulfur content of the emergency fuel (for the Byron Station tanks and, with the exception of the auxiliary boiler tank, the Dresden Station tanks); and

- Empty the higher sulfur tanks and refill them with ULSD as part of a "coordinated tank cleaning and equipment preventative maintenance program designed to maintain compliance with NRC technical specifications and licensing requirements and protect public safety" (for the Clinton Station tanks, the LaSalle Station tanks, and the auxiliary boiler tank at Dresden Station). Pet. at 4, 5, 17-18; Pet. App. C, Table 9 n.18; Resp. at 8.

Exelon also proposes that upon issuance of the variance, the sulfur content of all diesel fuel bought for the emergency equipment must not exceed 15 ppm, *i.e.*, must be ULSD. Pet. at 19. During the three-year, four-year, and five-year terms of the variance, Exelon would limit the

sulfur content of all diesel fuel combusted by the respective emergency equipment to 250 ppm. *Id.* The highest sulfur concentration sampled was 230 ppm and most concentrations were well below that (Pet. App. B, Tables 5-8), but Exelon selected 250 ppm as the combustion limit "to be conservative and provide a compliance margin" (Pet. at 18 n. 8).

Because Exelon already buys ULSD and commits to keep on buying it, sulfur concentrations in the tanks will necessarily continue to decrease during the variance period. Resp. at 8. The Board agrees with Exelon that tailoring different combustion limits on a tank-by-tank basis would require much more labor for fuel sampling and ultimately provide no additional environmental benefit. *Id.*

In addition, Exelon proposes to maintain records demonstrating compliance with the variance conditions, retain the records for at least five years, and provide copies of the records to IEPA within 30 days after a request. Pet. at 19. Also, within 30 days after discovering any deviation from a variance condition, Exelon would notify IEPA of the deviation. *Id.* at 20. Finally, to offset additional SO_2 emissions under the variance, Exelon agrees to a condition requiring it to purchase and retire 50 tons of Illinois-based SO_2 Group 1 allowances under the Cross-State Air Pollution Rule. 2nd Resp. at 1-2.

The Board finds all of these conditions appropriate with two small amendments. First, a variance and its conditions do not bind a petitioner *until* the petitioner executes a certificate of acceptance, files the executed certificate with the Board, and serves a copy of the executed certificate upon IEPA. *See* 35 Ill. Adm. Code 104.240. Accordingly, this variance cannot *require* Exelon to purchase 15 ppm sulfur fuel alone *as soon as the Board issues this order*—at that point, Exelon cannot yet have executed, filed, and served the certificate of acceptance. The Board therefore gives Exelon 35 days from today's date (*i.e.*, on or before October 13, 2016) to process the certificate so as to make the variance and its conditions binding upon the company. Correspondingly, the Board makes the condition requiring Exelon to buy only ULSD effective as of October 13, 2016, though the Board has no reason to believe that Exelon, in the interim, would discontinue its nine-year practice of buying only ULSD. Second, the Board requires Exelon to purchase and retire the 50 tons of Illinois-based SO_2 Group 1 allowances in annual 10-ton increments, *i.e.*, one increment during each year of the five-year variance period.

CONCLUSION

The Board finds that requiring Exelon to timely comply with the Sulfur Content Rule (35 Ill. Adm. Code 214.161(b)(2)) at the four nuclear power plants would impose an arbitrary or unreasonable hardship on the company. The Board also finds that the requested variance relief is consistent with the Clean Air Act and its regulations. The Board therefore grants Exelon a variance from the Sulfur Content Rule, subject to conditions. The variance delays the date from which each of the four nuclear power plants must comply with the rule: instead of January 1, 2017, Byron Station and Dresden Station's compliance date is January 1, 2020; Clinton Station's is January 1, 2021; and LaSalle Station's is January 1, 2022.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

The Board grants Exelon Generation, LLC (Exelon) a variance from the Sulfur Content Rule (35 Ill. Adm. Code 214.161(b)(2)) as that provision applies to the diesel fuel used by the emergency equipment at Exelon's Byron, Clinton, Dresden, and LaSalle nuclear power plants, subject to the following conditions:

General

1. In this order, "emergency equipment" means emergency generators, auxiliary boilers, and fire pumps.

2. On and after October 13, 2016, the sulfur content of all diesel fuel purchased for use by the emergency equipment at any of the four nuclear power plants must not exceed 15 parts per million (ppm).

Byron Station and Dresden Station

3. From January 1, 2017 through December 31, 2019, the sulfur content of all diesel fuel used by the emergency equipment must not exceed 250 ppm.

4. On and after January 1, 2020, the sulfur content of all diesel fuel used by the emergency equipment must comply with 35 Ill. Adm. Code 214.161(b)(2).

Clinton Station

5. From January 1, 2017 through December 31, 2020, the sulfur content of all diesel fuel used by the emergency equipment must not exceed 250 ppm.

6. On and after January 1, 2021, the sulfur content of all diesel fuel used by the emergency equipment must comply with 35 Ill. Adm. Code 214.161(b)(2).

LaSalle Station

7. From January 1, 2017 through December 31, 2021, the sulfur content of all diesel fuel used by the emergency equipment must not exceed 250 ppm.

8. On and after January 1, 2022, the sulfur content of all diesel fuel used by the emergency equipment must comply with 35 Ill. Adm. Code 214.161(b)(2).

Sulfur Dioxide Allowances

9. Exelon must purchase and retire fifty tons of Illinois-based sulfur dioxide (SO_2) Group 1 allowances under the Cross-State Air Pollution Rule as follows: purchase and retire one ten-ton increment of SO_2 allowances in each year of the five-year variance period that begins on January 1, 2017.

Recordkeeping and Reporting

10. Exelon must:

    a. Maintain records demonstrating compliance with conditions 1 through 9 of this order; and

    b. Retain all records required by condition 10(a) of this order for at least five years and provide copies of the records to the Illinois Environmental Protection Agency (IEPA) within 30 days after receiving a request by IEPA.

11. Exelon must notify IEPA within 30 days after Exelon discovers a deviation from any of the requirements in conditions 1 through 9 of this order. At a minimum, and in addition to any permitting obligations, the notification must include a description of the deviation, a discussion of the possible causes of the deviation, any corrective actions taken, and any preventative measures taken.

IT IS SO ORDERED.

If the petitioner chooses to accept this variance, the petitioner must, on or before October 13, 2016, file with the Board, and serve upon IEPA, an executed certificate of acceptance, signifying the petitioner's agreement to be bound by all terms and conditions of the variance. "A variance and its conditions are not binding upon the petitioner until the executed certificate is filed with the Board and served on [IEPA]. Failure to timely file the executed certificate with the Board and serve [IEPA] renders the variance void." 35 Ill. Adm. Code 104.240. The certificate form follows this Board order as an appendix.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2014); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, John T. Therriault, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on September 8, 2016 by a vote of 4-0.

John T. Therriault

John T. Therriault, Clerk
Illinois Pollution Control Board

CERTIFICATE APPENDIX

CERTIFICATE OF ACCEPTANCE

I, Roland D. Beem, having read the opinion and order of the Illinois Pollution Control Board in docket PCB 16-106, dated September 8, 2016, understand and accept the opinion and order, realizing that this acceptance renders all terms and conditions of the variance set forth in that order binding and enforceable.

Petitioner: EXELON GENERATION, LLC

By: Roland D. Beem
Authorized Agent

Title: Midwest Environmental Programs Manager

Date: 09/13/16